

# United Utilities £15m 'Croal' UID Project

## 18 outputs each with own criteria integrated into sewer network

**Y**ear 4 of United Utilities (UU) AMP3 period saw a huge increase in the number of Urban Pollution Management projects to address Unsatisfactory Intermittent Discharges (UIDs) across the whole of the north west of England to address new EA regulations for River Water Quality. In UUs Central Area, the framework team was tasked with finding a solution to 91 such unacceptable sewer overflow discharges. The overall UID contract of circ £40 million was split into cluster groups dependent on the watercourse to be improved.



Thompson Road, Bolton: 1150m<sup>3</sup> off line detention tank

courtesy: KMI Water

One of these, the **Croal UPM project** was valued at £15 million and consisted of 18 outputs each with its own set of design and build criteria to integrate into the existing sewer network.

In UUs Central Area the framework team consists of *United Utilities, MWH, and KMI Water*. The Croal contract was awarded in May 2003 with a regulatory delivery by date, for the complete programme of 31st March 2004.

The project consisted of 18 considerably sized construction sites that, because of the location of the existing sewer network, would be situated in densely populated urban locales. Consideration, therefore, needed to be given to restricted space and the proximity to residents.

Of the 18 sites, nine involved the construction of storm sewage detention tanks to store the excess spilled flows until such time as the sewage system is able to convey flows to the wastewater treatment works.

### Sion Street, Bury

The location known as Sion Street in Bury, required the construction

of a 2,500m<sup>3</sup> detention tank with pumped return to store screened spill flows. This chamber was to be built off line from the existing sewer and included 1200mm and 1050mm diameter diversionary pipework with associated manholes. All flows to the detention tank would then be screened to 6mm in both directions through a *Longwood Stormguard* powered screen, installed in a bifurcation chamber. Finally, the electrical and instrumentation equipment for main control and *vacflush* would be installed in specially constructed GRP kiosks.

### Thompson Road, Bolton

This location was designated for the construction of a 1150m<sup>3</sup> off-line detention tank with pumped return to store screened spill flows from the existing CSO chamber. Work included the reconstruction of weirs in the existing CSO chamber to accommodate two *Longwood Stormguard* powered screens, such that all flows to the detention tank would be screened to 6mm in both directions. Many project constraints were overcome, including residents concerns at the size of the detention tank to be built in a small piece of open grassland with residential properties to three sides. In addition, some of the pipework connection involved using directional drilling and tunnelling techniques. These specialist



practices were required to be employed between two residential properties raising concerns with the homeowners. The construction team worked closely with all third parties involved enabling this considerable construction to be completed on time and to all parties satisfaction.

#### **Cemetery Road, Farnworth, Bolton**

The solution here involved abandoning an existing large CSO chamber housing raked bar screens and an open channel. The solution required the construction of a CSO chamber to be fitted with two *Longwood* powered screens, associated pipeline, manholes and flow diversion chambers. The construction of the CSO was yet again within metres of a quiet residential area and set into a 1:3 gradient hillside.

#### **Hacken Lane (Dragons Tooth)**

The existing CSO spilled directly into the **River Croal** through a 1100mm outfall pipe. The project called for modification to the existing CSO chamber to remove the overflow facility and construction of a new CSO powered screen chamber further downstream. A detention tank was constructed to provide 1600m<sup>3</sup> storage capacity with a *Vacflush* cleaning system, duty/standby variable speed pumps and scavenger pump. A new reinforced concrete spill flow chamber and associated pipework was necessary to pass spill flows into the existing CSO overflow pipe, once the detention tank storage volume had been exceeded. Two kiosks housed the main controls, associated ICA system and mechanical plant for the *Vacflush* system.

**Salford** was also within the Croal catchment and formed the location for two sites requiring construction of approximately 200m<sup>3</sup> of storage with screened bifurcation chambers. **Bury** had an additional three sites, all with a need for detention tank storage.

#### **Bolton's additional six sites involved:-**

**Hacken Works** – work on the existing CSO structure to construct a new spill weir to replace the existing weir/siphon arrangement as well as modification work to upgrade the structure. Powered screen retrofitted in the existing brick culvert, upstream of the existing CSO structure.

**Bridge Street** – Construction of a new on-line combined sewer overflow chamber, ancillary equipment and control kiosk.

**Ginger Fold** – originally a complex arrangement consisting of a vortex and cascade flow structure. Flows were split into continuation and spill-flows delivered to a level approximately 18m lower, before leaving the structure through a 2m diameter tunnel. The project consisted of modification to the existing cascade flow structure, construction of a new CSO powered screen chamber upstream of the existing CSO and associated pipelines, ancillary equipment and a new steel control kiosk.

**Stoneclough Road** – retrofit of a screen within an existing CSO chamber.

**Stonehill Road** – construction of a new combined sewer overflow chamber, associated pipelines, ancillary equipment and control kiosk.

**Valletts Lane** – this site was riddled with major utility service pipes, had difficult ground conditions and the route of the existing culverted watercourse was not clearly defined. The team developed a construction design to overcome the initial issues and encompass value-engineering factors. The scheme changed from construction of one 100m<sup>3</sup> off-line detention tank, two bifurcation and static screen chambers to become a combined detention tank, static screen chamber and single bifurcation chamber.

#### **Finally, the Croal UID study took the programme to Manchester City Centre, see photo left.**

Bridge Street is a busy highway, a key pinch point for traffic entering the city from Salford and the west. The site of the existing sewer network dictated the new CSO chamber with *Copa Crosswave screen* would be situated in the middle of the busy A34. The site was, therefore, established in the centre of the highway to allow single lane traffic flow to either side of the construction site.

In order to deliver the project ahead of schedule and reinstate the highway, a close working relationship was forged between KMI Water, United Utilities, MWH and Manchester City Council, which proved to be beneficial to the projects success. The relationship was fermented by frequent progress meetings, for which the council expressed considerable gratitude. In addition by working extended hours, pre-casting the cover slab and putting this in place overnight, valuable construction time was saved. Effective selection, use and positioning of plant and equipment also contributed to an overall process of time saving measures.

Equally, the close working relationships of all members of the team, including the designers who provided working solutions at very short notice on occasions, enabled the project to be completed two weeks early.

#### **Conclusion**

The Croal UID UPM scheme was complete with P2P in place prior to the deliverable date of 31 March 2004. United Utilities expressed thanks that the team had not only achieved the Croal outputs but also in excess of the total 91 originally contracted. ■

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